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Coincident Seine and Sport Catches of Coho and Chinook Salmon in Saanich Inlet, B.C., with Sampling Data and Sport Fishing Methods

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ABSTRACT

Simpson, K. S. and R. K. Kadowaki. 1990. Coincident seine and sport catches of coho and chinook salmon in Saanich Inlet, B.C., with sampling data and sport fishing methods. Can. Data Rep. Fish. Aquat. Sci. 786: 168 p.

This report contains coho and chinook catch and sampling data from Saanich Inlet, British Columbia. It was collected during the summer and fall of 1985 in a study of the effect of size, sex and origin on the vulnerability of young coho and chinook to sport fishing. Sport fishermen were given one day permits to retain coho and chinook that were smaller than the size limit. There is length, sex, age and mark occurrence data from seine catches and from sampling of sport catches. Seine set data are presented and the sport catch data also show how each fish was caught (e.g. gear type, fishing depth, and hook size).

Key words: Data reports, angling, purse seining, vulnerability, sex, size distribution, catching methods, Oncorhynchus kisutch, Oncorhynchus tshawytscha

RÉSUMÉ

Simpson, K. S. and R. K. Kadowaki. 1990. Coincident seine and sport catches of coho and chinook salmon in Saanich Inlet, B.C., with sampling data and sport fishing methods. Can. Data Rep. Fish. Aquat. Sci. 786: 168 p.

Le présent rapport livre des données de capture et d'échantillonnage relatives aux populations de saumon coho et de saumon quinnat dans l'inlet Saanich, en Colombie-Britannique. La collecte des données a eu lieu pendant l'été et l'automne 1985 au cours d'une étude de l'influence de la taille, du sexe et de l'origine sur la vulnérabilité des jeunes des deux espèces à la pêche sportive. Des pêcheurs sportifs, titulaires de permis d'un jour, ont conservé des cohos et des quinnats d'une longueur inférieure à la longueur minimale permise. On a obtenu des données sur la longueur, le sexe, l'âge et la présence de marques par des captures à la senne et des échantillonnages de prises. Les auteurs présentent aussi des données sur le nombre de prises par coup de senne et les données d'échantillonnage indiquent comment on a capturé les poissons (p.ax., le type d'engin utilisé, la profondeur de pêche et la grosseur des hameçons).

Mots clés: Données, pêche sportive, pêche à la senne coulissante, vulnérabilité, sexe, répartition par grosseur, méthodes de capture, Oncorhynchus kisutch, Oncorhynchus tshawytscha

INTRODUCTION

This report presents the data obtained from our study of the vulnerability of young coho and chinook salmon to sport fishing. The study occurred from July to November, 1985, in Saanich Inlet. Saanich Inlet is on the southeastern coast of Vancouver Island, north of Victoria, B.C. (Fig. 1). The objective was to measure the effect that size, sex and origin may have on the catchability of coho and chinook that are recruiting to the sport fishery in their first six months at sea. By "origin" we mean whether the fish were raised in an enhancement facility or in the wild. Evaluation of the results required that we also document how the angled fish were caught (gear, depth, etc.).

Although all but a few coho are too small to be legally retained at this age, not all survive hooking and release. Knowing when and at what size they recruit to the sport fishery and what biological and fishery parameters affect this recruitment is important to properly manage the resource. For example, very little is known about the growth schedules of males and females. Different schedules can be expected to affect the time each sex becomes catchable and will determine when each is legally retainable. The importance of more recruitment data was evident from the modelling by Argue et al. (1983) of the Georgia Strait chinook and coho fishery.

An analysis of the data in this report has been done and is submitted to a journal (unpubl. MS, L. B. Holtby et al., DFO, Pacific Biological Station, Nanaimo, B.C., V9R 5K6).

METHODS

The strategy was to compare the size, sex and origin of the sport catch to the Saanich Inlet population that they came from.

SPORT CATCH

The sport catch had to include fish that would normally be released because they were under the size limit (30 cm for coho and 45 cm for chinook). We asked sport fishermen using the Tsartlip boat launching ramp, the major sport fishing access to the inlet, to keep these fish under a one day permit from the

Department of Fisheries and Oceans (DFO). They were also asked to record for each fish: when they caught it, what method they used (e.g. downrigger), what type of lure and hook they used and how large the hook was. We approached all the fishermen that used the ramp on a sampling day. There were 43 sampling days between July 5 and November 16.

Upon their return, our samplers recorded the fork length (to the nearest mm), sex and species of each fish. They noted any fin clip marks and took scale samples: five from chinook (two from one side and three from the other) and two from coho (one from each side). They kept the heads of adipose-clipped fish for later extraction and reading of coded wire tags. Undersized fish were preserved and the sampling was repeated in the laboratory as a check on the initial sampling data.

SEINE CATCH

The Saanich Inlet population was sampled with small mesh purse seines. We assumed that the seine catches were a virtually unbiased sample of the population. There were 37 days of seining, divided into four sessions:

Session	Dates	Research Vessel
1	July 3-10	CALIGUS
2	Aug. 15-23	TAHLOK
3	Sept. 17-25	CALIGUS
4	Oct. 29 - Nov. 8	TAHLOK

Both vessels are DFO research fishing ships. The CALIGUS is a 17 m seiner of 37.5 t and the Tahlok is 11 m long and 9.3 t. The net on the CALIGUS was 275 m long by 26 m deep. The mesh in the lead was 51 mm and graduated down to 13 mm before the bunt. The bunt mesh was 10 mm. The TAHLOK's net was 210 m x 24 m with 51 mm mesh in the lead, graduating down to 6 mm mesh in the bunt. Both nets were 2/3 purses.

We averaged about seven sets each day, beginning at about 7:30 PST and usually ending in mid-afternoon (although the end time was highly variable). Coho and chinook were killed in a bath of seawater that was aerated with carbon dioxide. Each catch was refrigerated for sampling after the day's fishing. Other species of fish were counted and released except large catches of non-salmonids which were visually estimated and released.

We recorded the same data as the sport catch samplers and took heads from adipose-clipped fish. We took scales in the same manner except, starting in session two, we took scale smears rather than individual scales from small chinook. In addition, we tested in the first session the use of adipose fin lengths and upper jaw lengths to sex coho, a technique suggested by previous work (e.g. Beacham and Murray 1986). If successful, it would have allowed us to release coho after sampling. The adipose length (basal origin to posterior tip) and jaw length (combined length of premaxillary and maxillary bones) were taken from 295 male and 252 female coho. The results were negative (Unpubl. MS, L. B. Holtby et al., Pacific Biological Station, Nanaimo, B.C., V9R 5K6).

RESULTS

SPORT CATCH SAMPLES

The sampling crew approached 1,278 fishing parties and 1,180 (92%) agreed to participate. We expected about 2,000 parties but fishing effort had declined in 1985 based on our analysis of the 1984 Creel Survey data from Tsartlip ramp (T. Hoyt, DFO, 3255 Stephenson Point Road, Nanaimo, unpubl. data). The catch rate of 0SW coho and chinook (zero sea winter annuli on the scale) was also less than we expected based on the Creel Survey data, so our sample sizes of coho and chinook were substantially below expectations. The 0SW sample sizes were 331 coho and 133 chinook. There were 88 1SW coho and 528 1SW and older chinook salmpled. The sampling data is in Appendix Table 1. This table also shows how and when each fish was caught.

A few 0SW coho were being angled from the first day of sampling, July 5. 0SW chinook were first found in late July but their proportion in the sport catch was not substantial until mid-September. We grouped the sport sampling days into four periods, centered on the four seining sessions. The length frequencies of sport-caught coho and chinook from each period are shown in Appendix Tables 4-8.

SEINE CATCH SAMPLES

Our seining objective was to catch about 1,000 coho in each session. This was accomplished in all but the last session. Others have had good catches of 0SW coho (but not chinook) in Saanich Inlet in early December using deeper seines (Heizer and Argue 1972). The reason we caught only 113 0SW coho and 139 0SW chinook in the November session may be because the fish were below the effective fishing depth of the Tahlok's seine. This depth is 15-20 m depending on the current (K. Cooke, DFO, Pacific Biological Station, Nanaimo, pers. comm.). Chinook appeared in the seine catch later than coho. Most were caught in August and September.

The daily catches varied greatly (Appendix Table 2). Typically, we caught most of the target number of coho in a few successive days in each session. We do not know why some days were much better than others. The coho appeared suddenly, perhaps because they were ascending from deeper, inaccessible depths. The presence of coho was almost always indicated by jumpers. The following catches are for 0SW coho:

Set Type	N	Catch/set (Geometric mean)	95% C.I.
Blind	77	2.8	1.37- 5.58
Echosounder	12	0.5	0.02- 8.91
Jumpers	91	6.1	3.43-10.70

Echosounder sets were made after seeing fish-like targets on the echosounder, usually schools of possible prey fish. The catch success of truly blind sets was much less than this summary indicates because many "blind" sets were made in the same area after a successful set had been made on jumpers.

Catches were highly variable spatially as well as temporally. We searched throughout the inlet in each session but virtually all the coho and chinook were caught within one km of the west shore between Mill Bay and Spectacle Creek (Fig. 1). Often the best area was very small. For example, McCurdy Pt. to Sheppard Pt. was much more productive than elsewhere in Session Two. Catches were usually greatest as near to shore as we could go. Fishing with the smaller Tahlok along the steep shores south of Bamberton, the set was often started within 10 m of shore.

The sampling data are in Appendix Table 3. Length frequencies of seine-caught coho and chinook are given in Appendix Tables 4-8.

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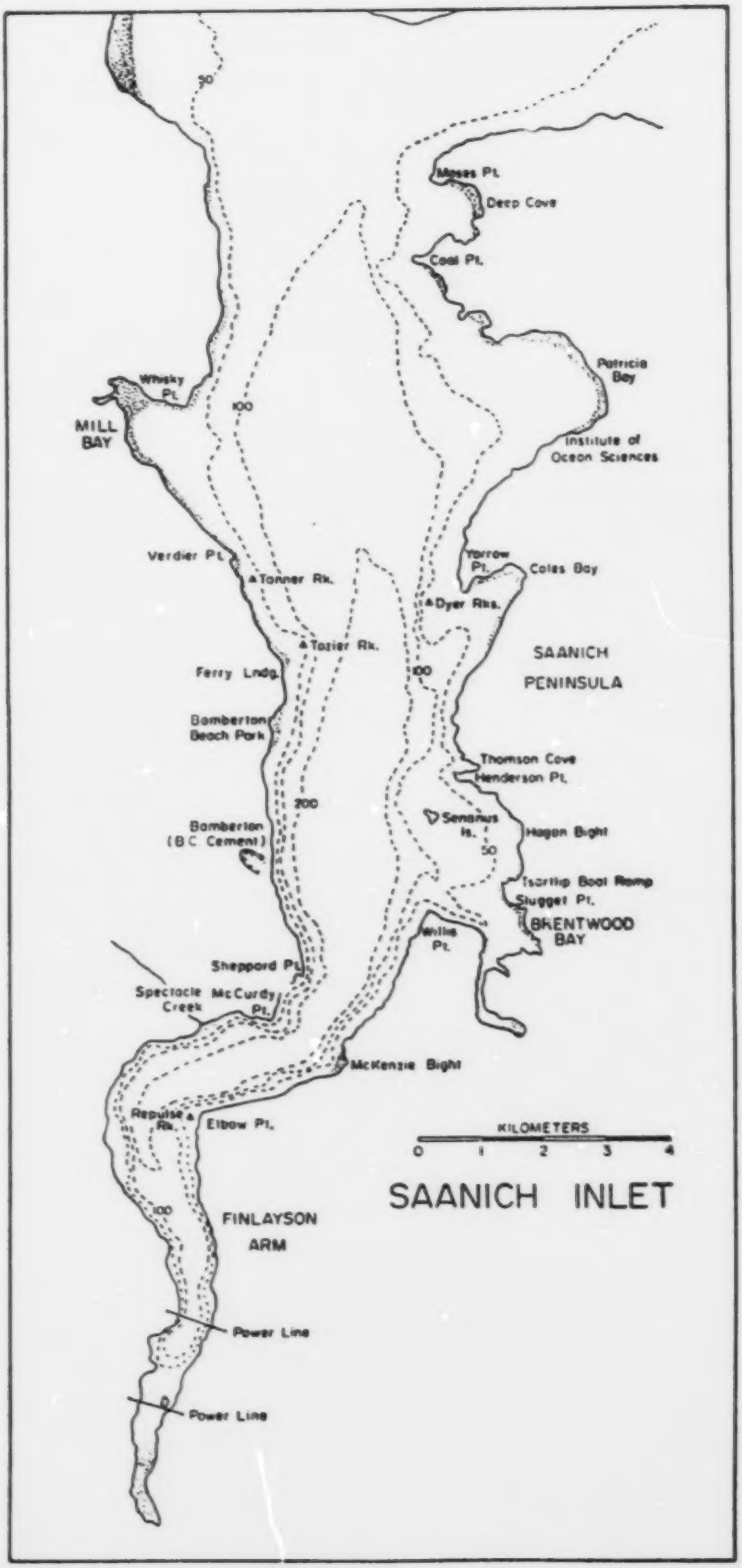

Fig. 1. A map of Saanich Inlet showing the place names that were used to describe locations of seine sets in 1985.

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